

AMENDMENTS TO THE DRAWINGS:

Amendments to Figure 1 to include additional reference numerals have been made in the attached Replacement Sheet of drawings.

REMARKS

Reconsideration of the rejections and objections made in the March 27, 2008 Office action is respectfully requested based upon the following comments.

STATUS OF CLAIMS AND SUPPORT FOR AMENDMENTS

Upon entry of this Amendment, claims 14-30 will be pending in this application. Claims 1-13 have been canceled without prejudice to, or disclaimer of, their subject matter.

Applicants have amended the specification to insert the headings suggested by MPEP § 608.01(a). Support for the summary paragraph can be found in claim 1 as originally filed. Support for the paragraph providing the brief description of the drawing can be found in the specification at page 10, lines 5-7. In addition, Applicants have amended the specification at page 10, lines 18-25 to remove reference numeral "19," which does not appear in Figure 1.

Applicants submit herewith a replacement sheet of drawing containing reference numerals alleged by the Examiner to be missing. Support for the addition of the reference numerals can be found in the specification at page 10, line 9 to page 11, line 11.

Applicants have replaced claims 1-13 with new claims 14-30. New claim 14 is supported by originally filed claim 1 and Figure 1, and has been restructured to more clearly point out the feature that the first concentrate and second concentrate are different materials. This is supported by the specification, *inter alia*, at page 6, lines 20-28, and at page 10, lines 18-25. Claim 14 also recites the feature that the leaching solution contains an acid. This feature is disclosed in the specification, *inter alia*, at page 7, lines 8-11, page 10, lines 21-23, and page 11, lines 29-30.

Precipitation of iron from the leaching step is disclosed, *inter alia*, in the specification at page 10 lines 27-28. Neutralization in the leaching step is described in the specification, *inter alia*, at page 10 lines 27-28.

New claim 15 is supported by the specification, *inter alia*, at page 6, lines 23-25.

New claim 16 is supported by the specification, *inter alia*, at page 11, lines 22-27.

New claims 17 and 18 are supported by original claim 2, and by the specification, *inter alia*, at page 7, lines 8-33.

New claims 19-25 are supported by original claims 3-9, respectively.

New claim 26 is supported by the specification, *inter alia*, at page 10, line 18.

New claims 27-30 are supported by original claims 10-13, respectively.

No new matter has been added.

DRAWING OBJECTION

In paragraph 3 of the Office action, the Examiner has objected to the drawing because it does not include reference numerals 1-14, 16-18, and 20-21 mentioned in the specification. As indicated above, Applicants submit herewith a replacement sheet of drawing containing these reference numerals. Accordingly, the Examiner's objection should be withdrawn.

OBVIOUSNESS REJECTIONS

A. Claims 1-3 and 7-9, over Baczek

In paragraph 4 of the Office action, the Examiner has rejected claims 1-3 and 7-9 under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 4,256,553 (Baczek).

Applicants respectfully traverse this rejection as applied to the claims now of record for the reasons given below.

The Examiner asserts that:

Baczek teaches that ground chalcopyrite from grinding mill 11 is split into two streams and the first stream is directed to a leach circuit which yields a solution of copper sulfate (well soluble component) (col. 4, lines 36-43). This well soluble component is separated from the remaining poorly soluble components, which includes unreacted ground chalcopyrite (sulfide form iron) (col. 4, lines 44-45 and 58-66). Baczek discloses a separator 50 from which components 63 than can be regarded as "well soluble" are transported to a leaching step 24, while components 52 that can be regarded as "poorly soluble" are transported to a conversion step.

Office action of March 27, 2008, page 4.

Applicants' claims recite that the copper sulfide-containing ore is concentrated into two different concentrates (i.e., into two concentrates containing components that have different solubilities in the leaching solution) prior to leaching, and that the second concentrate is leached. In Baczek, the ground chalcopyrite is ground and separated into two identical streams (i.e., each containing components that have the same solubility in a leaching solution) prior to leaching. It is only after leaching has occurred (i.e., after the soluble components have been removed by leaching) that Baczek discloses any difference between the streams with regard to solubility in the leaching solution. In other words, the streams that go to the leach circuit and the conversion circuit in Baczek are identical, while Applicants' claims recite a concentrating step to produce two different streams, one of which goes to a leaching step, and the other of which goes to a converting step. Nowhere does Baczek disclose or suggest such a concentrating step, and as a result, Baczek fails to teach or suggest every feature recited in claim 14.

Alternatively, if the Examiner is attempting to correlate the first conversion step 46 of Baczek to the concentrating step recited in Applicants' claims, then Applicants note that the claims recite a separate concentrating step, and at least two conversion steps. If the first conversion step 46 of Baczek is to correspond to Applicants' concentrating step, as the Examiner appears to imply, then the remaining converting step 54 of Baczek supplies the only step that can reasonably be alleged to correspond to Applicants' converting steps. Since converting step 54 is a single converting step, there are not sufficient converting steps disclosed in Baczek to correspond to the series of two conversion steps recited in Applicants' claims. Thus, if first conversion step 46 is considered to correspond to Applicants' claimed concentrating step, then Baczek fails to disclose or suggest every feature recited in claim 14, and this rejection should be withdrawn.

In any event, Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness of claim 14 over Baczek because Baczek fails to disclose or suggest every feature of Applicants' independent claim 14. Moreover, claim 17 further specifies the second conversion step, and the features recited therein are even more clearly not disclosed or suggested in Baczek.

In addition to failing to disclose a concentrating step and/or a converting step containing a series of at least two conversion steps, Baczek fails to disclose neutralization and iron precipitation in the leaching step, as recited in claim 14. In Baczek, iron is maintained in the solution and used as a leaching agent. See Baczek, column 4, lines 37-40. Rather than precipitate iron, Baczek uses the leach circuit to precipitate sulfur and precious metals. See Baczek, column 5, lines 46-53.

Moreover, Applicants submit that characterizing the leaching process of Baczek as corresponding to the leaching of a well-soluble components in Applicants' second concentrate is incorrect. The leach circuit of Baczek is directed to leaching of chalcopyrite, and requires conditions that are more severe than would be necessary for the leaching of a well soluble component. For example, the main leaching step of Baczek is step 24, which Baczek discloses uses added oxygen (see column 5, lines 3-6). Applicants submit that one of ordinary skill in this art would recognize that the need to add oxygen in the leaching step provides further indication that the components of the concentrate are not well soluble, since well soluble components do not typically require the addition of oxygen in order to be leached.

The Examiner also appears to assume that the conversion circuit disclosed in Baczek corresponds to the first conversion recited in claim 14. However, it is essential to the conversion of Baczek that sulfur dioxide is used as an additional agent. As Applicants have stated in the specification at page 4, lines 7-8, the use of sulfur dioxide results in excess sulfuric acid formation, and is thus advantageously avoided in Applicants' method.

Baczek also fails to disclose removing copper sulfide from a first conversion, as recited in Applicants' independent claim 14; any copper sulfides produced in the first conversion of Baczek are either sent to the leach circuit, or are passed to the second conversion.

The Examiner also appears to take the position that at least part of the solution obtained in the conversion of Baczek is recycled back to the leaching step. However, in the process of Applicants' claims, the second concentrate stream

passes through the leaching step, then to the first conversion step, and a portion of the resulting converted stream is recycled from the first conversion step back to the leaching step. In Baczek, a chalopyrite-containing stream passes through the first conversion step (without having been leached), and is sent to the leaching step before any stream from the leaching step has entered the conversion circuit (i.e., stream 63 is taken off from the conversion circuit and sent to the leaching circuit at separating step 50, while stream 14 from the leaching circuit enters the conversion circuit at step 54, after the first conversion step, and after stream 63 has been removed from the conversion circuit). Accordingly, Baczek fails to disclose first passing a stream through the leaching step, and then passing the resulting stream through the first conversion step, and then returning the resulting converted stream from the first conversion step to the leaching step, as recited in Applicants' independent claim 14.

In addition, in Baczek, the solution coming from the second conversion stage 54 is fed to the first conversion stage 46. The solution of the conversion stages must be adjusted to contain all iron in divalent form, and iron is crystallized from the solution after the first conversion stage 46 as ferrous sulfate in step 64. The copper sulfate solution added with the sulfuric acid is fed to the leach circuit. Iron that is dissolved both in the leach circuit and the conversion circuit is precipitated only before recycling to the leach circuit. See Baczek, column 8, lines 32-40 and 48-51. By contrast, in Applicants' independent claim 14, iron is precipitated from the solution during leaching, and prior to feeding it to a second conversion step. Baczek fails to disclose or suggest this feature of Applicants' claim 14. Moreover, Applicants respectfully submit that the approach taken by Baczek will increase the amount of

liquid recycling in the process, compared to the amount of liquid recycling necessary in Applicants' claimed process.

With respect to the subject matter now recited in claims 17 and 18, the Examiner has asserted that Baczek teaches that "different metal components are converted to sulfidic form by means of sulfide-form iron, in the form of chalcopyrite, fed into the conversion step (44 fed into 46)." Applicants respectfully submit that Baczek does not describe a second conversion step where metals other than copper are converted into sulfide form by reaction with sulfide-form iron. Instead, Baczek describes precipitation of other metals during precipitation of ferrous sulfate, for disposal. See Baczek, column 8, lines 40-47. The presence of sulfide-form iron in this precipitation stage is not mentioned. Applicants submit that, for at least this reason, Baczek fails to make obvious claims 17 and 18.

With respect to claims 24 and 25, Applicants note that these claims depend from claim 17, and as explained above, Baczek does not disclose the conversion of metals other than copper by reaction with sulfide-form iron, and in particular by reaction with troilite or pyrrhotite.

B. Claim 4 over Baczek in view of Richmond

In paragraph 5 of the Office action, the Examiner has rejected claim 4 under 35 U.S.C. § 103(a) as obvious over Baczek in view of U.S. Patent No. 6,537,440 (Richmond). Applicants respectfully traverse this rejection as applied to claim 20 for the reasons given below.

Even if, *arguendo*, the Examiner properly combined the teachings of Richmond with those of Baczek, no *prima facie* case of obviousness exists because Richmond fails to cure the deficiencies of Baczek noted above with respect to claim

14. Since claim 20 depends from claim 14, all of the differences between the disclosure of Baczek and claim 14 noted above are also applicable to claim 20. Because the Examiner merely alleges that Richmond teaches autoclave leaching, and does not allege that Richmond cures any of the deficiencies noted above with respect to claim 14, even if the suggested combination were made, a *prima facie* case of obviousness would not exist.

Moreover, since the Examiner evidently considers Baczek to be closer prior art to Applicants' claimed process than is Richmond, and since Baczek teaches that autoclaves should be avoided (column 1, line 64 to column 2, line 11):

The use of high temperature and high pressure autoclaves is expensive both in capital costs and in operation. In addition, autoclaves cause the oxidation of at least some of the sulfur contained in the chalcopyrite to sulfate, an undesirable end product which must be removed from the system.

Baczek, column 2, lines 6-11. Applicants respectfully submit that one of ordinary skill would have disregarded any alleged suggestions in Richmond to use autoclave leaching in the process of Baczek, because Baczek teaches away from such a combination.

C. Claims 5 and 6 over Baczek in view of Johnson

In paragraph 6 of the Office action, the Examiner has rejected claims 5 and 6 under 35 U.S.C. § 103(a) as obvious over Baczek in view of U.S. Patent No. 3,957,602 (Johnson). Applicants respectfully traverse this rejection as applied to claims 21 and 22 for the reasons given below.

Even if the Examiner arguably properly combined the teachings of Johnson with those of Baczek, no *prima facie* case of obviousness exists because Johnson fails to cure the deficiencies of Baczek noted above with respect to claim 14. Since

claims 21 and 22 depend from claim 14, all of the differences between the disclosure of Baczek and claim 14 noted above are also applicable to claims 21 and 22.

Because the Examiner merely alleges that Johnson teaches a conversion temperature range, and does not allege that Johnson cures any of the deficiencies noted above with respect to claim 14, even if the suggested combination were made, a *prima facie* case of obviousness would not exist.

D. Claims 10-12 over Baczek in view of Heimala

In paragraph 7 of the Office action, the Examiner has rejected claims 10-12 under 35 U.S.C. § 103(a) as obvious over Baczek in view of U.S. Patent No. 5,108,495 (Heimala). Applicants respectfully traverse this rejection as applied to claims 27-29 for the reasons given below.

Even if the Examiner arguably properly combined the teachings of Heimala with those of Baczek, no *prima facie* case of obviousness exists because Heimala fails to cure the deficiencies of Baczek noted above with respect to claim 14. Since claims 27-29 depend from claim 14, all of the differences between the disclosure of Baczek and claim 14 noted above are also applicable to claims 27-29. Because the Examiner merely alleges that Heimala teaches the use of mineral specific electrochemical measurements to control process steps, and does not allege that Heimala cures any of the deficiencies noted above with respect to claim 14, even if the suggested combination were made, a *prima facie* case of obviousness would not exist.

E. Claim 13 over Baczek in view of Gabb

In paragraph 8 of the Office action, the Examiner has rejected claim 13 under 35 U.S.C. § 103(a) as obvious over Baczek in view of U.S. Patent No. 5,616,168

(Gabb). Applicants respectfully traverse this rejection as applied to claim 30 for the reasons given below.

Even if the Examiner arguably properly combined the teachings of Gabb with those of Baczek, no *prima facie* case of obviousness exists because Gabb fails to cure the deficiencies of Baczek noted above with respect to claim 14. Since claim 30 depends from claim 14, all of the differences between the disclosure of Baczek and claim 14 noted above are also applicable to claim 30. Moreover, Gabb teaches a conversion step in which copper sulfate is converted to copper sulfide with the aid of sulfur or sulfur dioxide, and does not teach conversion to copper sulfide with the aid of sulfide-form iron contained in a poorly soluble concentrate, as recited in Applicants' claim 14, combined with the conversion of precious metals with the aid of sulfide-form iron. As a result, Gabb does not teach a first conversion step corresponding to Applicants' claim 30 from which precious metals are recovered. Accordingly, even if the suggested combination were made, a *prima facie* case of obviousness would not exist.

Applicants respectfully submit that claims 14-30 are in condition for immediate allowance, and an early notification to that effect is respectfully requested. If the Examiner believes that further issues remain to be resolved, he is respectfully requested to contact the undersigned so that an interview may be arranged to discuss these remaining issues.

Respectfully submitted,

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